**Stat and Data Analysis**

**CH 5 MC Review**

**The next six questions (# 22-27)** concern this situation: Do doctors in managed care plans give less charity care? Researchers chose 60 communities at random, then chose doctors at random in each community. In all, they interviewed 10,881 doctors. Overall, 77.3% of the doctors said they had given some care free or at reduced rates because of the patient's financial need in the month before the interview. Doctors who received at least 85% of their practice income from managed care plans were significantly less likely than other doctors to provide charity care.

1. This study is

(a) an experiment. (b) an observational study, but not a survey (c) a census. (d) a sample survey.

2. The individuals in this study were selected using

(a) a stratified sample. (b) voluntary response. (c) a simple random sample. (d) a multistage random sample.

3. The number 77.3% is

(a) a statistic, because it describes a sample. (b) a statistic, because it describes a population.

(c) a parameter, because it describes a sample. (d) a parameter, because it describes a population.

4. Some doctors who did not give any charity care may say that they did. If so, the study suffers from

(a) a large margin of error to take account of possible failure to be truthful.

(b) sampling errors that require a better random sampling design.

(c) bias: the sample result will systematically underestimate the true percent of doctors who give charity care.

(d) bias: the sample result will systematically overestimate the true percent of doctors who give charity care.

5. When you drop your pencil point blindly into the middle of a table of random digits, what is the chance that the three digits to the right of where you land will be 999?

(a) 1 in 100, because every three-digit group has the same chance to come up.

(b) 1 in 1000, because every three-digit group has the same chance to come up.

(c) no chance, because 999 is not a random group of digits.

(d) can't say -- it is completely random.

6. Increasing the size of an SRS has these beneficial effects:

(a) the bias of the sample is reduced relative to smaller SRSs.

(b) the variability is smaller than it is for smaller SRSs.

(c) nonsampling errors become less important

(d) (a) and (b) but not (c).

(e) all of (a), (b), and (c).

7. When we take a census, we attempt to collect data from

(a) a stratified random sample (b) every individual selected in a simple random sample

(c) every individual in the population (d) a voluntary response sample (e) a convenience sample

8. A table of random numbers is used to select 30 students from a statistics class to rate a statistics video. The ratings that these students give are used to estimate the ratings that would be given if the entire class were asked to rate the video. The average of the ratings of all students in the class is

(a) a population parameter (b) a convenience sample (c) a census (d) the population

(e) a statistic that is an unbiased estimate of the class rating

9. An instructor has five sections of a course: A, B, C, D, and E. She wants to randomly select three sections for a special teaching evaluation. She labels the classes as follows:

A = 1, B= 2, C = 3, D =4 and E =5. She starts at the beginning of this list of random digits:

15689 14227 06565 14374

Which classes did she select?

(a) A, E, and A (b) A and D (c) A, B, and C (d) B, C, and D (e) A, D, and E

10. For a sample to be a simple random sample of size *n*,

(a) the variability must be small (b) *n* must be a large number (c) every item in the population must be selected

(d) every collection of *n* individuals must have the same chance to be the sample actually chosen

(e) the size of the population must be smaller than *n*

11. Which of the following is correct

(a) parameters describe population characteristics (b) parameters describe sample characteristics

(c) the population is a subset of the sample (d) statistics must be based on a simple random sample

12. Suppose that we take many simple random samples of size 20 from a large class and for each sample we compute the average height of the students in the sample. Which of the following statements is true?

(a) the sample means are parameters (b) the mean height of the class is a statistic (c) *n* = 460

(d) there is always bias when we choose simple random samples

(e) the variation in the means of the samples is described by a distribution

13. If a sampling method is biased then

(a) we need to improve the sampling method to remove the bias. (b) we need to increase the sample size to remove the bias.

(c) we should sample from a larger population (d) the sample statistic will be close to the population parameter.

(e) the center of the distribution of the statistic will be close to the population parameter.

14. If we take a simple random sample of size *n*=500 from a population of size 5,000,000, the variability of our estimate will be (a) less than the bias.

(b) much less than the variability for a sample of size *n* = 500 from a population of size 50,000,000.

(c) approximately the same as the variability for a sample of size *n* = 500 from a population of size 50,000,000.

(d) plus or minus 5%. (e) much greater than the variability for a sample of size *n* = 500 from a population of size 50,000,000.

15. To reduce the variability of estimates from a simple random sample, you should

(a) use a smaller sample (b) increase the bias (c) use a count not a percent (d) use a larger sample (e) use a percent not a count

16. A survey was sent to a simple random sample of college sophomores. The sample size was 300. When asked whether or not they liked Willie Nelson's music, 35 of these students did not give any answer. This is an example of

(a) a stratified sample (b) a census (c) bias (d) nonresponse (e) the margin of error

17. To take a sample of students in this class we make a list ordered by social security number and select every 20th student in this list to be in our sample. This is an example of

(a) systematic sampling (b) simple random sampling (c) stratified random sampling

(d) clustered sampling (e) multistage sampling

18. When Ann Landers asked her readers to tell her "if your sex life has gone downhill after marriage," more than 100,000 people responded. This is an example of

(a) a voluntary response sample. (b) a simple random sample (c) a stratified sample.

(d) a convenience sample. (e) a well designed survey.

Sale of eggs that are contaminated with salmonella can cause food poisoning among consumers. A large egg producer takes an SRS of 200 eggs from all the eggs shipped in one day. The laboratory reports that 9 of these eggs had salmonella contamination. Unknown to the producer, 0.1% (one-tenth of one percent) of all eggs shipped had salmonella. **The next two questions (#19-20)** refer to this situation.

19. In this situation,

(a) 0.1% is a parameter and 9 is a statistic. (b) 9 is a parameter and 0.1% is a statistic. (c) both 0.1% and 9 are parameters. (d) both 0.1% and 9 are statistics. (e) 0.1% is an estimate and 9 is a margin of error.

20. Based on the sample data, the producer estimates that the proportion of contaminated eggs in the population is about

(a) 0.2% (b) 0.045%. (c) 3%. (d) 4.5%. (e) 20%

21. You plan to give a math achievement test to samples of 15 year-olds from both the U.S. and Korea in order to compare mathematics knowledge in the two countries. In each country, you will choose

300 students from low-income families

400 students from middle-income families

200 students from high-income families

The sample from Korea is a

(a) multistage sample. (b) simple random sample. (c) convenience sample.

(d) voluntary response sample. (e) stratified sample.

22. An example of a nonsampling error that can reduce the accuracy of a sample survey is:

(a) Using voluntary response to choose the sample.

(b) Using the telephone directory as the sampling frame.

(c) Interviewing people at shopping malls to obtain a sample.

(d) Variation due to chance in choosing a sample at random.

(e) Many members of the sample cannot be contacted.

23. In a table of random digits it is true that

(a) every pair of digits has chance 1/100 to be any of the 100 possible pairs 00, 01,…, 99.

(b) if a pair of digits is 00, the next pair cannot also be 00.

(c) every row has exactly the same number of 0's and 1's.

(d) (a) and (b) but not (c).

(e) All of (a), (b), and (c).

24. A radio talk show invites listeners to call a telephone number to vote "Yes" or "No" on whether they support a bond issue for a new school. About 1500 people call in. Over 80% say "No." As an estimate of community opinion, this result is

(a) accurate to within 3% with 95% confidence. (b) not trustworthy because of nonsampling errors.

(c) not precise because the sample size 1500 is too small. (d) unethical due to lack of informed consent.

(e) badly biased due to voluntary response.

25. You must choose a simple random sample of 7 lots from a shipment of 80 lots of vaccine for testing. You label the lots 01, 02, 03, ..., 80 and then use the random number table to select your sample. The chance that any one lot is chosen for the sample is

(a) random because the sample is random. (b) can't say without looking at the random number table.

(c) 1 in 80. (d) 7 in 80. (e) 7 in 100.

26. A typical opinion poll uses a sample size between 1000 and 1500 people. The Current Population Survey samples 50,000 households every month to gather data on employment and unemployment. The main advantage of the much larger sample is

(a) there is less bias in a large random sample. (b) a large random sample has a smaller margin of error. (c) a larger random sample allows use of stratified sampling. (d) nonsampling errors are smaller in a large random sample.

27. The United Presbyterian Church recently took a sample of opinion in the church. The overall sample "contains independent random samples of 1537 members, 1400 elders, 1513 pastors and 714 other clergy." This sampling design is a

(a) multistage sample. (b) voluntary response sample. (c) simple random sample. (d) stratified sample.

28. Some common sources of nonsampling error in samples of human populations are

(a) using voluntary response samples; some subjects lie.

(b) some subjects lie; some subjects can't be contacted.

(c) some subjects can't be contacted; drawing a sample from names in a telephone directory.

(d) Both (b) and (c).

(e) All of (a), (b), and (c).